

Abstract:

A deployable and retractable space frame structure which requires no assembly, and can be either manually or automatically activated. It comprises rigid end rings or the like which attach to a multitude of spaced trusses of generally slender aspect ratio. The trusses are fabricated of two or more generally rigid, beam like strips which are hinged so as to become very flexible and non rigid when hinged strip elements lie planarly flattened, thus allowing the structure to collapse into a minimum volume state. In this configuration truss beams assume a curvature approximating the curvature of the structure end rings. Upon deployment, the truss beams become straight, and hinged beam-like strips fold to create a triangular cross sectional moment of inertia to become very rigid and straight. The structure is deployable and stow-able an infinite number of times, and is suitable for a wide variety of applications including telescope structures, portable building and antennae masts, planetary vehicles, space stations, and the like.